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Course Code : 09PP13 / 09PD21

Roll No:

(To be filled in by the candidate)

PSG COLLEGE OF TECHNOLOGY, COIMBATORE - 641 004

SEMESTER EXAMINATIONS, OCTOBER / NOVEMBER - 2012

ME – PRODUCTION ENGINEERING / PRODUCT DESIGN AND COMMERCE

Semester: 3 / Ph.D (PT) MECHANICAL ENGG.,

09PP13 / 09PD21 RAPID PROTOTYPING

Time : 3 Hours

Maximum Marks : 100

**INSTRUCTIONS:**

1. Answer **ALL** questions from PART - A and Answer any **4** questions from PART - B. Question under PART - C is Compulsory.

**PART - A**

Marks : 10 x 3 = 30

1. Why the rapid prototyping technique is more flexible and faster in producing prototypes than that of the traditional manufacturing methods, such as machining or casting?
2. "Rapid prototyping is an integral part of time compression engineering" – Justify the statement
3. Classify the rapid prototyping processes according to state of aggregation of their original material.
4. What is virtual prototyping? Can an engineer totally rely on virtual prototyping for carrying out product development? Justify your answer.
5. What is meant by trapped volume? How it affects the accuracy of the SLA process?
6. Mention the uses of magics and mimics softwares.
7. List down the technical specifications of SLS systems.
8. Differentiate (i) Direct and Indirect rapid tooling methods (ii) Hard tooling and Soft tooling methods.
9. Write down the process sequence carried out in epoxy indirect rapid tooling method.
10. Mention any six uses of reverse engineering technology.

**PART - B**

Marks : 4 x 12.5 = 50

11. a) How can the conventional FDM system be redesigned to a mobile one for flexible manufacturing applications? Discuss. (7)
- b) What is meant by concept modeler? Explain how 'JP system 5' is used to build conceptual prototypes. (5.5)

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12. Mention the steps involved in data preparation procedure to build prototypes in SLA process. Explain each of them in detail with sketches. (12.5)
13. a) Discuss the principle of building prototypes using laminated sheets in LOM process. Mention its advantages and limitations over other RP processes. (5)
- b) Explain the sequence of steps involved in building prototypes using liquid resins in SGC process. How SGC differs from SLA process? (7.5)
14. a) Mention the data storage procedures in STL file. Explain the common errors that occur in STL file with sketches. (6)
- b) Discuss the spray metal deposition rapid tooling process in detail. (6.5)
15. a) How vacuum casting process is used for producing accurate silicon tools for casting parts with fine details and very thin walls? Discuss with sketches. (7.5)
- b) What is meant by surface digitizing? Discuss the steps involved in generating the surface from point cloud. (5)

**PART - C**

Marks : 1 x 20 = 20

16. Discuss in detail with sketches the data preparation, part building and part finishing errors that occur in rapid prototyping process.

/END/

FD/RL